transition

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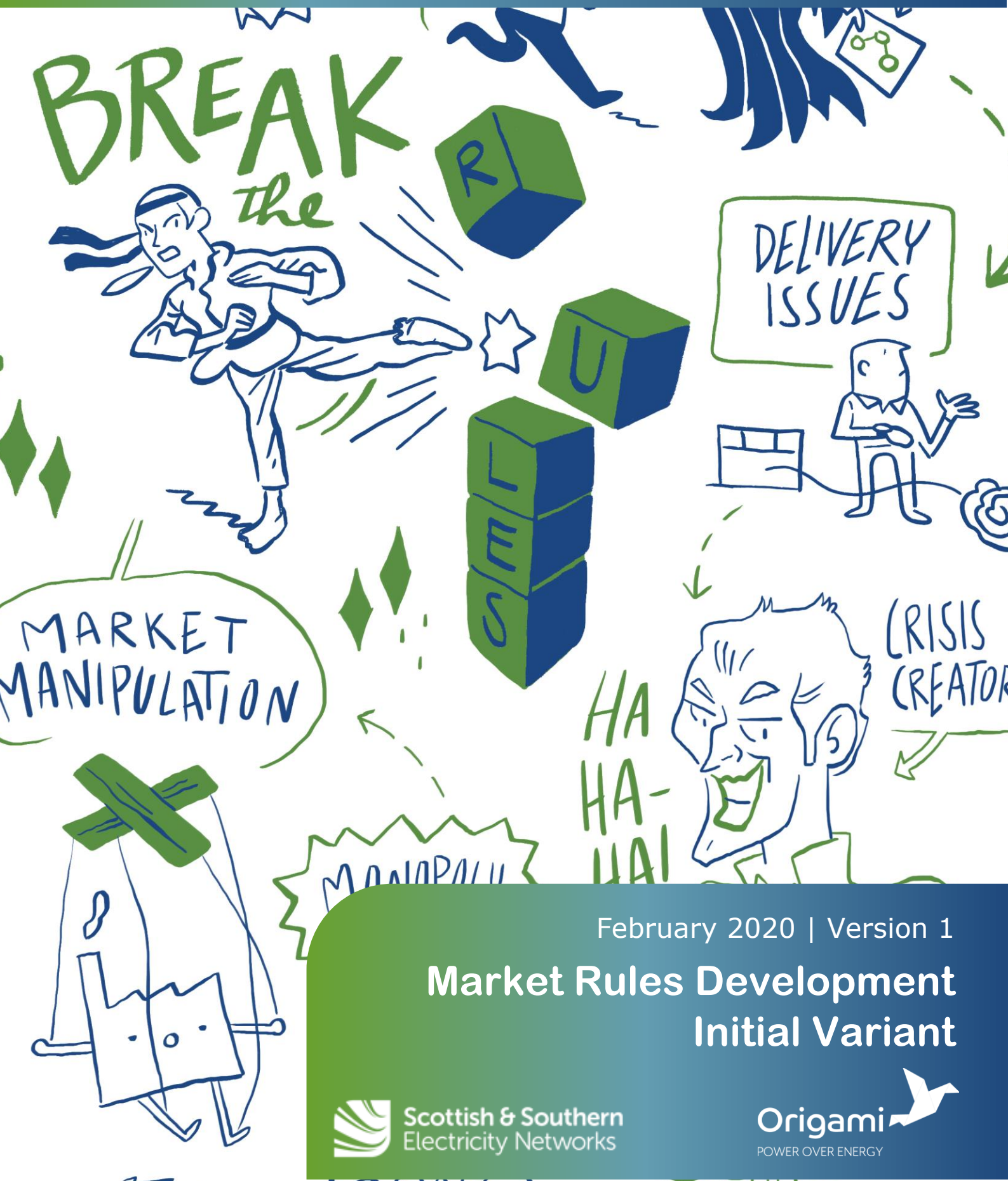

February 2020 | Version 1

Market Rules Development Initial Variant

Scottish & Southern Electricity Networks

Origami POWER OVER ENERGY

Origami

POWER OVER ENERGY

TRANSITION

Market Rules Development v0.4

3 February 2020

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Executive Summary

As the number and capacity of embedded generation projects continues to increase beyond 13.1GW of PV capacity[1] and 13.6GW of onshore wind capacity[1] across GB, there is an increasing requirement to manage the network issues that arise, including overvoltage, protection and thermal ratings of assets. Automated Network Management (ANM) has enabled a greater penetration of renewable generation at lower overall cost, but the uncertain future level of curtailment has meant a small but increasing number of potential projects have been unable to demonstrate economic viability and have thus not been built. Embedded flexibility is being considered by Distribution Network Operators (DNOs) to address constraint issues in place of reinforcement and the first commercially viable contracts for flexibility outside of innovation trials were announced by UK Power Networks in July 2019[2].

There is also a need from organisation that can or could participate in the market (Market Actors, e.g. aggregators, asset owners, suppliers and traders) for peer-to-peer (P2P) trading between Market Actors to minimise the effects of constraints on generation and demand customers and to enable new projects to achieve financial close, supporting GB on its transition towards a net zero target by 2050. As all of these services come into effect, there will be an increased need for interactions between all Market Actors to avoid any unintended consequences.

Flexibility service rules are used to govern the delivery of individual flexibility services and, currently, the majority are balancing services delivered by a variety of Market Actors to the Electricity System Operator (ESO)[3], an established but evolving market. Similar rules apply to the emerging DNO flexibility services market. However, in a Distribution System Operator (DSO) world, there is expected to be a wider range of services to meet the needs of all market actors, not just those of the ESO and / or DSO, but between Market Actors, necessitating a new suite of rules. The complexity of this developing market creates a need for market rules that will govern;

[1] "Digest of UK Energy Statistics (DUKES)", published by Department of Business, Energy and Industrial Strategy, 25 July 2019 (Table 6.4)

[2] https://www.ukpowernetworks.co.uk/internet/en/news-and-press/press-releases/UK-Power-Networks-announces-results-of-UKs-biggest-ever-competitive-Flexibility-tender.html, 15 May 2019

[3] https://www.nationalgrideso.com/balancing-services

- govern the locational aspects of flexibility services that could compete across multiple markets that are based locally, regionally and nationally;
- how flexibility services are prioritised at times of system stress;
- how the conflicting needs of Market Actors are addressed; and
- how Market Actors can exceed their (contractually-binding) maximum import or export capacity to meet their business needs whilst maintaining system security.

The TRANSITION project will deliver up to five defined flexibility services[4] using a variety of flexible resources and this report considers the development of a set of Basic Market Rules (BMR) that will govern the delivery of these flexibility services during the TRANSITION project. The BMR was developed after considering various existing contracts for the delivery of flexibility services, the issues that could affect the DSO and the need to minimise the scope for gaming of the rules whilst aiming to avoid any unintended consequences.

Recognising the large number of consultations, TRANSITION developed an alternative and more interactive means of obtaining feedback on the BMR. The resulting War Games (changed to Market Rules Simulation for external stakeholders, Events) involved attendees adopting the role of a Market Actor with three main activities;

- trade the portfolio of flexibility assets held by the Market Actors;
- consider how the BMR work under various scenarios to identify errors, omissions and any unintended consequences; and
- consider how the BMR could be broken by market behaviour or manipulation.

The format and BMR were iterated through three stages; development (within Origami to develop the format and materials), iteration (via the TRANSITION and supporting project Local Energy Oxfordshire (LEO) teams to test the format and materials) and delivery at two external stakeholder Events. The materials used for the external stakeholder Events are provided in the appendices together with feedback received during the day. It is notable that some participants at the external stakeholder

[4] "Services in a Facilitated Market", upload date 21st August 2019

Event took materials with them at the end of the day which was a positive reflection on the quality of the Events.

Events required a high level of engagement and participation from attendees which ensured there was a lot of feedback on Events and the BMR. Feedback has shown that attendees enjoyed the interactive format which made the Events highly successful, primarily due to the high level of attendee participation and engagement which made them more enjoyable and memorable for attendees and valuable for the development of the BMR. Where appropriate, learning has been fed directly into the ON-P Workstream 3 Conflicts of Interest and Unintended Consequences log, maintaining a single source from which to refer.

Feedback from one participant stands out, "**I recently attended another DNO feedback event which was very much a telling session without any engagement with or from the audience. This event is the best DNO event I have been at due to its interactive nature and the level of engagement required**".

1 Project TRANSITION

TRANSITION is designed to help understand the changes required to the traditional distribution network design, maintenance and operation, to consider new market models, and to trial new services under various scenarios. TRANSITION is partnered with project LEO, facilitating a greater breadth of learning. The outcomes from TRANSITION and project LEO will inform the Energy Networks Association Open Networks Project (ON-P) to which TRANSITION is dynamically aligned. TRANSITION will inform a number of ON-P Workstreams and the most applicable to the development of the market rules are;

- Workstream 3 which is developing a more detailed view of the required transition from DNO to DSO, including the impacts on existing organisation capabilities prior to the implementation of the DSO; and
- Workstream 1A which is considering all aspects of flexibility.

TRANSITION will be completed in three stages:

- Phase 1 - design the solution for the Neutral Market Facilitator (NMF) and Whole System Coordinator (WSC) and how they will interact with the existing DNO IT systems; develop the roles and responsibilities of Market Actors; develop simple rules to enable the delivery of selected services; and determine the location and requirements of a trial in Phase 2.
- Stage Gate (aligned with EFFS and FUSION [5]) - a formal opportunity to review progress, compare outcomes and ensure the programme is still aligned with wider industry initiatives and to determine whether it is still valuable to continue with TRANSITION and continue with Phase 2.
- Phase 2 – procure DSO systems required to undertake the TRANSITION trials, implement a NMF and WSC solution that enables data exchange between industry actors participating in the trials and trading of flexibility services and conduct a wide scale trial to test the services, roles and rules and inform ON-P.

[5] The 2017 Network Innovation Competition funded projects "Electricity Flexibility and Forecasting System" (awarded to Western Power Distribution to develop an IT platform to forecast network capacity and identify opportunities to trade flexible network services) and "FUSION" (awarded to SP Energy Networks to test a technical and commercial solution developed in Europe to resolve constraints on the distribution network), https://www.ofgem.gov.uk/system/files/docs/2017/11/ofg1031_innovation_competitions_brochure_web.pdf, 30 November 2017.

The outcomes and learnings from TRANSITION will inform ON-P, particularly Workstream 3, which is developing a more detailed view of the requirements for transition from a largely reactive DNO model to a more proactive DSO model.

2 Developing the Basic Market Rules

The initial development of the BMR considered market rules that were developed for other projects, including; Electricity System Operator Firm Frequency Response [6] and Flexible Power by Western Power Distribution[7].

The initial BMR developed by Origami can be categorised in the areas highlighted in Figure 1. By nature, the BMR is an enabling set of rules with a number of generic rules that refer to the individual services to specify details that apply to that service, e.g. rule 2.1.1.

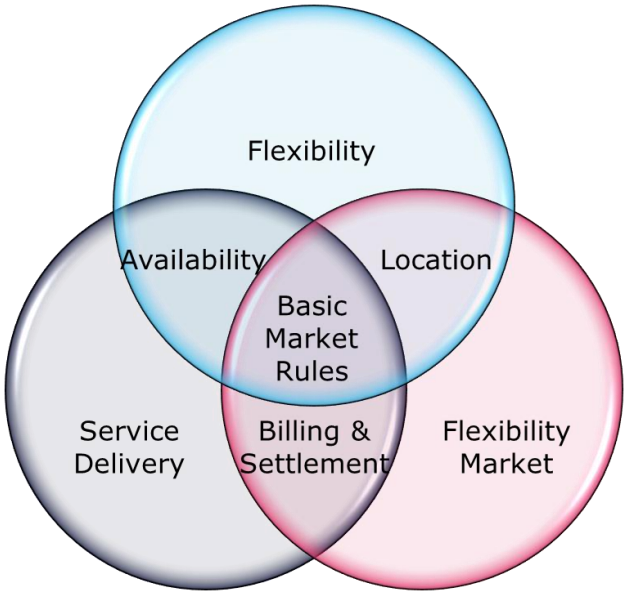

Figure 1 - Areas addressed in the BMR

Each Event considered the suitability of the BMR to address specific scenarios, categorised as follows;

- Asset Availability
- Bad Weather
- Data Availability
- Delivery Performance
- DNO Planned Outage
- DNO System Changes
- DNO Unplanned Outage
- DSO Request
- Emergency System Action
- Failure to Perform
- Flexibility Service Test
- Pre-Auction

[6] Firm Frequency Response Tender Rules and Standard Contact Terms, Issue 10, 8 October 2019.

[7] Constraint Management Zone (CMZ) Services Agreement v3.1, 18 March 2019

- Service Stacking
- Transaction Approval

The scenarios stimulated discussion on the suitability of specific rules to address the scenario and whether any changes were required or there were any unintended consequences. The BMR were then changed to incorporate the feedback.

3 Events

Events were a one day interactive workshop to solicit feedback on the BMR through a variety of scenarios.

Each Event had the same standardise format;

- Market actors (except DSO) trade their portfolio of assumed flexibility assets for the delivery of a planned peak service to the DSO with four stages;
  - announcement of the DSO needs;
  - trading of flexibility between Market Actors, all in the same room (excluding DSO);
  - trading between each Market Actor and the DSO; and
  - feedback from the DSO on purchases.
- consider various scenarios from the Market Actor perspective and feedback on whether the BMR is fit for purpose or if there are any errors, omissions or unintended consequences; and
- consider how the BMR could be broken by market behaviour or manipulation.

Details of organisations that attended an Event and the materials for the stakeholder Event are provided in the appendices;

- Appendix 1 – Organisations that attended an Event
- Appendix 2 – Basic Market Rules for the External Stakeholder Event
- Appendix 3 – Presentation for the External Stakeholder Event
- Appendix 4 – Scenarios for the External Stakeholder Event (the presentation is from 24 October 2019 which included a discussion on the potential for participants in an ANM scheme to trade their position on the LIFO stack which was also included in the project LEO Event)
- Appendix 5 – Trading Cards for the External Stakeholder Event
- Appendix 6 – Visual Scribe Output from External Stakeholder Events

The Event evolved through five iterations as outlined in Table 1.

Table 1 - Iteration of Events

Activity	Origami Internal 1	Origami Internal 2	Project TRANSITION	Project LEO	External Events
Determine format	Yes				
Iterate format and materials		Yes	Yes	Yes	Yes
Homework for attendees		Yes	Yes	Yes	
Trial services [a]	1	2	2	2	1
Trial scenarios		28	28	28	15
Feedback on DSO trading			Yes	Yes	Yes
Request post-Event feedback					Yes
Scottish and Southern Electricity Networks (SSEN) attendees			Yes	Yes	Yes

TRANSITION partners attend			Yes		
Project LEO partners attend				Yes	
External stakeholders attend					Yes

a. the number of Trial Services was reduced due to time constraints and to provide additional focus on the scenarios with an audience comprising experienced Market Actors.

Attendees at early Events from TRANSITION and project LEO had a variety of backgrounds but little or no experience of certain Market Actor roles; to address this, Origami provided facilitators with relevant experience in and knowledge of these roles. The external Events had more experienced participants from the market which allowed the facilitators to focus on outcomes.

4 Feedback from Events

Feedback was solicited through a variety of means, including notes from observers and facilitators and using Sli.do and on the materials following the external stakeholder Events. Where appropriate, this has been fed directly into the ON-P Workstream 3 Conflicts of Interest and Unintended Consequences log.

4.1 Format and Materials for Events

Table 2 - Addressing Feedback from earlier Events identifies the feedback received from Events and how it was addressed for subsequent Events.

Table 2 - Addressing Feedback from earlier Events

Feedback Received	Change(s) Made for Subsequent Events
Arrange Market Actors into tables at outset to build relationships and avoid wasting time.	Changed for the project LEO and External Stakeholder Events.
More briefing on the trading round required, including high level introduction to the BMR.	A pre-Event briefing was added to some Events to demonstrate how the trading round works.

Feedback Received	Change(s) Made for Subsequent Events
More direction required to help attendees understand what is required to improve outcome.	Additional briefing of facilitators to ensure they could guide participants.
The location diagram was not used in the Event.	Location diagram was removed from later Events.
Simplify Trading Cards and include a reference price for Market Actors to trade against.	Changed for later Events.
Make the scenario cards more specific and include relevant market rules on each card.	Scenario cards amended to address feedback.
The trading round was too short; additional time would have been useful.	The trading round in later Events was increased by removing a second service to improve the attendee experience.
An additional trading round would help cement the learnings.	Time constraints prevented additional rounds of trading.
Include more real world examples.	Two Events provided feedback on outline proposals for changes to the LIFO stack for ANM.

4.2 Feedback on BMR

Table 3 identifies how feedback on the BMR was addressed. Feedback on unintended consequences is captured in section 4.3.

Table 3 - How feedback on BMR was addressed

Feedback Received	Change(s) Made
Need to standardise on the definition and use of terms across BMR and industry.	Clarified the use of terms in BMRs and, separately, input to ON-P on the standardisation of terminology.
More detailed guidance required on the application of the BMR.	Scenario cards were amended to include the rules relevant to the scenario and this will be considered further prior to the delivery of the first flexibility services in Summer 2020.
Clarify language and intent for several rules, particularly 1.5.1, 5.2.3, 4.2.1, 6.2.2 and 6.2.4.	Language in rules changed to address the issues.

Feedback Received	Change(s) Made
Rule 6.2 may not be fully aligned with ON-P.	Engage with ON-P to ensure alignment.
Standardise flexibility contract Ts&Cs to facilitate greater market participation.	Engage with ON-P to support standardisation of Ts&Cs.
Ability to substitute or replace flexibility is unclear.	Clarified in the latest version of the BMR (see Appendix 2).
The BMR did not adequately cater for some scenarios, e.g. effect of changing network open points on flexibility service delivery.	Changed specific rules to address the feedback and reformatted the relevant scenarios but Open Point issue requires further investigation.
Require clarification of when compensation is and is not payable.	Clarified in the latest version of the BMR (see Appendix 2).
The rules on compensation identified polarised views between some the DNO and Market Actors (particularly those who fulfil the role as their day job) and resulted in discussions around what could be reasonably foreseeable by the DNO.	Ensured this issue was re-created in future Events to garner additional feedback.

4.3 Unintended Consequences and Learning Points

These are summarised in Table 4.

Table 4 - Unintended Consequences and Learning Points and how they are to be addressed

Unintended Consequence or Learning Point	How to be addressed
Market Actors want compensated by Market Actors for any DNO outage.	The maximum penalty for non-provision of a DNO / ESO service is the revenue that would have been generated; address in service requirements.
The DSO could facilitate P2P services with little or no risk on the Market Actor.	Service specification for P2P services to consider a charge for services that provide additional benefit to the Market Actor to be used for compensation and / or reward to DNO.
The DSO should be incentivised to minimise their net costs of delivering services if the underlying system need no longer exists.	To be passed to ON-P for consideration.

Unintended Consequence or Learning Point	How to be addressed
The BMR needs to encourage innovation but prevent market manipulation in any sense.	To be considered further when the BMR are developed for Summer 2020 trials.
The BMR is relatively inflexible which could prevent smaller Market Actors from adopting a more innovative delivery approach or flexibility coming to market.	Address in amendments to BMR and consider the burden on Market Actors during the trials in Summer 2020.
Market Actors to be incentivised to deliver contractual commitments.	Strengthen delivery and performance commitments in BMR / service specifications.
Need a standard glossary across ON-P and industry.	Input to ON-P glossary.
Market Actors adopted a variety of strategies from small trades to understand prices to market dominance.	These strategies provided various learning points to participants who were unfamiliar with how the market operates or had little or no experience of the drivers or behaviours of other Market Actors.
The Events provided good feedback on the BMR.	A summary of learning points will be provided to ON-P.
LIFO discussions hinted that flexibility could be discounted to reflect the contribution at the constraint.	This approach is different to that adopted for demand which is effectively discounted by losses.

4.4 Word Maps from Sli.do

All attendees at the TRANSITION, project LEO and external Events were asked to summarise the day in one word. Figure 2 summarises the word maps; larger the words indicate more votes.

Figure 2 - One word summary of the Event

4.5 Next Steps

The format of Events is very different to that adopted for other innovation stakeholder engagement Events and the emotional reaction of attendees created a significant and positive effect on the value of the Event to both attendees and TRANSITION (and to the enduring memory of the Event and the project). SSEN has already started to disseminate information on the Event and will report it through ON-P, and project LEO. In addition, publishing this report will support wider dissemination.

The BMR will be revised in summer 2020 to align them with ON-P work and before any major TRANSITION trials commence.

During 2020 and 2021, TRANSITION and LEO propose a series of simulation events that builds on the format of the 2019 Events to explore a range of topics with industry actors. Please see www.ssen-transition.com/news for upcoming details.

Appendix 1 – Organisations that attended an Event

There were over 100 attendees across all the Events.

The following organisations attended at least one of the six Events.

Aggreko

Atkins

Bath & West Community Energy

Capgemini UK

CGI Inc.

Crowd Charge

EDF Energy

Electricity North West Ltd

Electron

Low Carbon Hub

National Grid ESO

Northern Powergrid

Nuvve

Opus One Solutions

Origami

Oxford Brookes University

Oxford City Council

Oxfordshire County Council

PassivSystems

Piclo (Open Utility)

RWE Supply and trading

Scottish and Southern Electricity Networks

SmartestEnergy Ltd

SSE Enterprise

UK Power Networks

University of Cambridge

University of Oxford

Western Power Distribution

WSP

Attendees came from a variety of backgrounds, including;

- Academia
- Account Management
- Aggregator
- Business Analyst
- Business Development
- Commercial Analytics
- Commercial Innovation
- Commercial Operations

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- Connected Customers
- DNO Connections
- DNO Innovation
- DNO Network Planning
- DNO Operations
- DNO Procurement
- Domestic Smart Control
- DSO
- Economic Regulation
- Electric Vehicles
- Electrical Engineering
- Electricity Retailer
- Energy Economics
- Energy Policy
- Energy Strategy
- Energy Trading
- Engineering and IT
- Engineering Innovation
- Flexibility Marketplace Platform
- Flexibility Markets
- Flexible Asset Management
- Flexible Connections
- Future Networks
- General Market Expert
- Innovation Project Delivery
- Market and Utility Software
- Market Platform
- Marketing
- Network Operations
- Networks Control Room
- New Products and Services
- Operational IT
- Power Generation
- Project Management
- Regulatory Governance
- Software Consultant
- Systems for Decentralised Energy Systems
- Systems for Recovering Energy
- Whole Systems Engineering

Appendix 2 – Basic Market Rules for the External Stakeholder Event

1 Flexibility

1.1 Approval to exceed Authorised Supply Capacity

1.1.1 No Market Actor should enter into any transaction that would involve them exceeding their import Authorised Supply Capacity or export Authorised Supply Capacity without the prior approval of the relevant DNO.

1.1.2 The DNO should respond to requests for exceeding their import Authorised Supply Capacity or export Authorised Supply Capacity within agreed timescales. Any penalties payable will be specified.

1.1.3 A Market Actor who obtains the approval from the relevant DNO to exceed their import Authorised Supply Capacity or export Authorised Supply Capacity should comply with the terms of such approval.

1.1.4 If a Market Actor exceeds their import Authorised Supply Capacity or export Authorised Supply Capacity without prior discussion and approval of the host DNO, the terms and conditions of their connection agreement will apply.

1.1.5 If a Market Actor obtains the approval of the host DNO prior to exceeding their import Authorised Supply Capacity or export Authorised Supply Capacity, the contract terms and conditions relating to such action shall be suspended for the duration of such transaction.

1.2 Measurement and accuracy

1.2.1 Flexibility capacity use for the trials under TRANSITION shall have measurement equipment capable of measuring the flexibility being delivered at the accuracy level specified in the definition of the service.

1.3 Data requirements and cadence

1.3.1 The data collected and the cadence of data collection in respect of each item providing flexibility capacity should be in accordance with the requirements specified in the definition of the service.

1.3.2 The data collected in respect of each item providing flexibility capacity should be provided to the buyer of the flexibility service in accordance with the requirements specified in the definition of the service or the approval to exceed Authorised Supply Capacity (if more frequent).

1.4 Flexibility service testing

1.4.1 Every item of flexibility capacity should comply with and pass the testing requirements for that flexibility service (if any) in accordance with the flexibility service description before it can participate in any transaction for that flexibility service.

1.4.2 If there are no testing requirements, the parties to the transaction shall agree appropriate testing requirements (if any).

1.4.3 If there is a material change in an item of flexibility capacity then that item of flexibility capacity should pass the testing requirements for all flexibility services for which the Item of flexibility capacity wishes to be considered (if any) in accordance with the flexibility service description before it can participate in any transaction for that flexibility service.

1.4.4 If the performance of an item of flexibility capacity is deemed to be poor by the flexibility service buyer over a number of delivery periods (in respect of a non-critical flexibility service) or at any time (in respect of a critical flexibility service), the flexibility service buyer can insist that the item of flexibility capacity should pass the testing requirements for all flexibility services for which the Item of flexibility capacity wishes to be considered (if any) in accordance with the flexibility service description before it can participate in any transaction for that flexibility service.

1.5 Dispute of flexibility approval

1.5.1 If there is a dispute over the ability of an item of flexibility capacity to deliver a specific flexibility service, the buyer of the flexibility service shall have the final decision, such decision not to be unreasonable or Inconsistent with similar decisions for other potential or actual providers of that particular flexibility service.

2 Location

2.1 Conditional service trigger

2.1.1 For flexibility services that rely on a conditional trigger, the trigger signal should be provided to the item of flexibility capacity within the timing constraints within the flexibility service description.

2.1.2 All fail safes for a conditional flexibility service should be demonstrated prior to the item of flexibility capacity being deemed capable of delivering that flexibility service.

2.1.3 Any item of flexibility capacity approved for a conditional flexibility service should be re-proven as capable to deliver that flexibility service in accordance with the flexibility service description.

2.2 Flexibility location

2.2.1 An item of flexibility capacity must comply with any locational requirements if is to be considered to provide a particular flexibility service, whether through a flexibility market transaction or not. Any failure to comply with this requirement will be addressed through the terms and conditions for that flexibility service.

3 Market Rules

3.1 Exceeding ASC without approval

3.1.1 If a Market Actor exceeds their import Authorised Supply Capacity or export Authorised Supply Capacity without prior discussion and approval of the host DNO, the terms and conditions of their connection agreement will apply.

3.2 Over procurement

3.2.1 Parties purchasing or providing a flexibility service can over-procure against their needs and the transaction will be subject to the terms and conditions between the parties in relation to that flexibility service.

3.3 Minimise scope for price arbitrage

3.3.1 Market Actors should transact on the best available information at the time of any offer or acceptance and should not seek to game the market or conduct arbitrage trades between flexibility services.

3.3.2 If any Market Actor is determined to have breached the price arbitrage rule, that Market Actor will be barred from the flexibility market for a period of time to be determined by the flexibility market operator.

3.4 Service stacking

3.4.1 To be determined through individual services (ESO, DSO, P2P).

3.5 Standard products

3.5.1 Standard products should be used on flexibility markets as they reduce barriers to entry, enable smaller opportunistic participation and increase market liquidity and competition.

4 Flexibility Market

4.1 Request to buy or sell flexibility

4.1.1 Items of flexibility capacity should have passed the testing requirements for that flexibility service (if any) in accordance with the flexibility service description before it can participate in any transaction for that flexibility service.

4.1.2 Requests to buy or sell flexibility capacity should be placed on the flexibility market in the first instance.

4.1.3 If the flexibility marketplace does not identify any viable flexibility capacity, the flexibility buyer may target potential flexibility providers directly without having to use the flexibility marketplace.

4.2 Availability

4.2.1 No item of flexibility capacity should offer flexibility to deliver a flexibility service if there is not a high chance that the flexibility will be available to deliver the flexibility service.

4.3 Incentives and Penalties

4.3.1 The structure and level of any payments, incentives or penalties for the delivery or non-delivery of a flexibility service will either be determined through flexibility marketplace offers using standard agreements or through bilateral agreements.

4.4 Participation in markets

4.4.1 All items of flexibility capacity should be approved to deliver that flexibility service before being approved to participate in the flexibility marketplace.

4.4.2 If any item of flexibility capacity participates in the flexibility marketplace without being approved to deliver that service, the item of flexibility capacity will be barred from providing flexibility services until it can prove it has been independently approved to deliver that flexibility service.

4.4.3 Market Actors can offer items of flexibility capacity across multiple markets to deliver different flexibility services. Once an item of flexibility capacity has been accepted to deliver a flexibility service the Market Actor should remove that item of flexibility capacity from being considered for any other flexibility service in all flexibility markets unless those flexibility services are approved for the stacking of flexibility services.

4.5 Acceptance of flexibility offers

4.5.1 All offers of flexibility that have been unconditionally accepted by a buyer of that flexibility service will be binding between the parties and any variation will be addressed in the contractual agreement between the parties.

4.5.2 Some transactions may be conditional on DNO approval and the parties should address such Issues in the contractual agreement between them.

4.6 Selection of successful offers

4.6.1 Flexibility buyers should publish the evaluation criteria for determining successful offers in advance of publishing the request for a flexibility service in order to maintain fairness and transparency of decision-making. Factors that may be considered include;

- price of the item(s) of flexibility capacity;
- parameters of the item(s) of flexibility capacity;
- the location of the item(s) of flexibility capacity;
- the relative contribution of an item of flexibility capacity to the flexibility service;
- the relative performance of an item of flexibility capacity and the relative risk to the flexibility service; and
- the basis on which an item of flexibility can be selected for the delivery of a flexibility service when it is otherwise out of merit.

5 Availability

5.1 Forecast of availability

5.1.1 The availability of items of flexibility capacity should declared in accordance with the flexibility service description.

5.1.2 If a flexibility service is to be provided by more than one item of flexibility capacity, the Market Actor should declare the availability of the items of flexibility capacity most likely to be used to deliver the flexibility service.

5.2 Changes to availability

5.2.1 Should the availability of an item of flexibility capacity change after the forecast of availability has been submitted, then the Market Actor should declare such a change in availability in accordance with the flexibility service description.

5.2.2 If a flexibility service is to be provided by more than one item of flexibility capacity, the Market Actor can replace one item of flexibility capacity for another, provided the replacement item(s) of flexibility capacity are approved to deliver that flexibility services.

5.2.3 Market Actors are able to replace one item of flexibility capacity for another provided the replacement item(s) of flexibility capacity are approved to deliver that flexibility service.

5.2.4 Changes to the availability of items of flexibility capacity should be submitted promptly after the Market Actor has become aware of the need to change the availability.

6 Service Delivery

6.1 Delivered energy

6.1.1 An item of flexibility capacity can only be used to deliver a service in accordance with the agreed parameters, unless otherwise agreed.

6.1.2 The level of service delivery will be determined using the measurement equipment in accordance with the flexibility service description.

6.1.3 The energy delivered during the ramp up and ramp down period will be treated in accordance with the flexibility service description.

6.1.4 If a flexibility service is to be provided by more than one item of flexibility capacity, the Market Actor should declare the aggregate level of service delivery across all items of flexibility capacity used to deliver the flexibility service.

6.1.5 Over-delivery and under-delivery against the level of service delivery will be treated in accordance with the terms and conditions of the flexibility service.

6.1.6 Any bounce back associated with an item of flexibility capacity will be treated in accordance with the flexibility service description.

6.2 Priority of access

6.2.1 There is no priority of access to items of flexibility capacity under normal operating conditions or during an unplanned outage of any plant or equipment that forms part of the distribution network or the transmission network unless there is an unplanned issue that threatens the local, regional or national electricity system.

6.2.2 In the event of an unplanned issue that threatens the local or regional distribution electricity system the DSO / DNO has priority access to items of flexibility capacity over the ESO and other Market Actors.

6.2.3 In the event of an unplanned issue that threatens the transmission network or the electricity system the ESO has priority access to items of flexibility capacity over the DSO / DNO and other Market Actors.

6.2.4 If priority access to items of flexibility capacity is declared, the affected Market Actors shall be compensated as if the delivery of any flexibility services, ancillary services or balancing mechanism had occurred during the period of priority access. If the item of flexibility capacity does not have a relevant price for the delivery of flexibility, the parties will determine a price with reference to prices being paid to other Market Actors to deliver the same flexibility service or through negotiation, both parties not being unreasonable.

6.2.5 There is no priority of one flexibility marketplace compared to any other.

6.3 Failure to deliver as per contract

6.3.1 Any failure to deliver a flexibility service will be treated in accordance with the terms and conditions of that flexibility service which may include repayment of the availability fee or other payment as under the relevant flexibility term and conditions.

6.3.2 If a flexibility transaction is affected by a DSO / ESO claims of priority access or where an agreed flexibility transaction is interrupted by the DSO / ESO for any reason, the relevant Market Actor offering the item of flexibility capacity should be compensated in accordance with 6.2.4.

6.3.3 If a Market Actor transacts with another Market Actor and this results in a breach or has an adverse effect on the DNO network, the Market Actor at fault will be responsible for the consequences for such breach.

6.4 Force Majeure

6.4.1 The DSO shall have no liability to any Market Actor that is prevented from entering into a transaction or is prevented from delivering, receiving or using a flexibility service as a result of;

- issue arising from storms and adverse weather events;
- the duration of a planned outage (provided statutory notice periods have been adhered to);
- any short-term network reconfiguration as a result of unplanned operational requirements (provided statutory notice periods have been adhered to); or
- circumstances outside the reasonable control of the DSO that could not have been predicted, including periods where priority access has been declared.

7 Settlement Support

7.1 Data

7.1.1 Data required to support declarations and changes of availability of items of flexibility capacity and the delivery of flexibility services should be provided in accordance with the terms and conditions of the flexibility service.

7.2 Reliability of performance

7.2.1 Agreed performance metrics should be provided for each item of flexibility capacity that wishes to provide a flexibility service through the flexibility markets so that decisions on performance reliability can be made.

8 Issues not covered

8.1.1 The communication process and notifications between;

- ESO and DSO;
- DSO and DNO; and
- Market Actors involved in a P2P service.

8.1.2 Understanding of asset performance required by DSO to make valued judgements.

8.1.3 Asset and contract performance, including credit worthiness of parties and force majeure.

8.1.4 The rights and obligations of parties.

8.1.5 Payment structure for flexibility services.

9 Revision of market rules

9.1.1 The basic market rules will be reviewed and iterated after each War Game and after each trial.

Appendix 3 – Presentation for the External Stakeholder Event

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transition
LEO

Welcome and H&S / Well-Being Moment (VG)

1030 - 1040

1030	Welcome and H&S / Well-Being Moment (VG)
1040	The Road to DSO (KM)
1055	Overview of TRANSITION and LEO (BW)
1105	Peak Management 1 (DM)
1130	**Break**
1145	Peak Management 2 (DM)
1300	**Lunch**
1330	LIFO Stack (NB)
1345	Scenario Testing (DM)
1500	**Break**
1515	How to Break the Market Rules (DM)
1545	Q&A and Review (BW)
1600	**Day Ends**

Aim to improve basic market rules for use in LEO trial from summer 2020

2

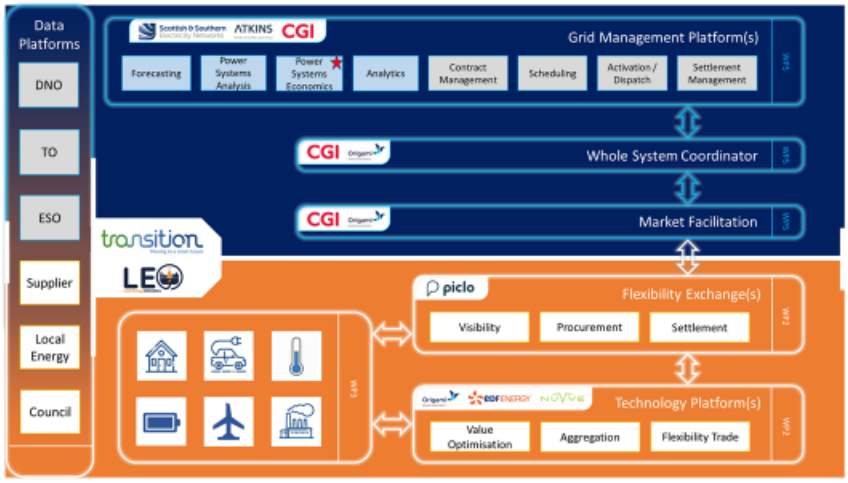
The Road to DSO (KM)

1040 - 1055

3

Overview of TRANSITION and LEO (BW)

1055 - 1105



4

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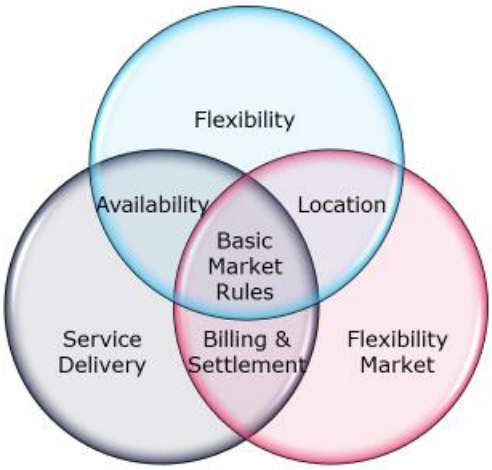
Peak Management Market Rules (DM)

1105 - 1115



The basic market rules will be discussed in three different ways;

- as they affect the delivery of a service (and the market actor);
- general discussion at the end of each round; and
- an exercise on how to break the rules

1

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Peak Management Service Overview (DM)

1115 - 1120

Service

- Peak Management service reduces demand on a critical asset
- Service is to be delivered 1630-1830 Monday-Friday during January
- Service is paid at the accepted price for each provider of flexibility
- Report on previous auction in pack

DSO requires to purchase 2,800kW of Peak Management

6

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Peak Management 4 Steps (DM)

1120 - 1130

1. Market Actors trade flexibility between themselves
2. Market Actors trade flexibility with DSO
3. DSO determines and announces outcome of trading round (in parallel with Step 4)
4. Market actors consider scenarios (in parallel with Step 3)

7

1130 - 1145

Break

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Peak Management Steps 1 to 4 (DM)

1145 - 1300

Step 1 (1145-1205)
Market Actors trade flexibility between themselves

Step 2 (1205-1220)
Market actors trade flexibility with DSO

Step 3 (parallel with Step 4) (1220-1230)
DSO determines and announces outcome of trading round

Step 4 (parallel with Step 3) (1220-1300)
Market Actors consider non-delivery scenarios

9

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Peak Management Step 4 – non-delivery scenarios (DM)

1220 - 1300

- Each market role has a number of scenarios to consider as a group;
- Each scenario directs you to rules to consider
- Consider;
  - did the rules address the outcome of the scenario?
  - were there any unintended consequences?
  - what changes should there be to the market rules?
- Facilitator to provide feedback (10 minutes)

10

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Peak Management DSO Report on Auction

1220 - 1230

Market Liquidity

- Dominant, difficult and relatively illiquid market
- Offers from 4 market actors (one withdrew), total of 9,100kW
- Technologies Offered were;
  - Battery
  - CHP
  - Flexible Demand
  - Solar PV
  - Wind

DSO Acceptances

- Acceptances issued for 1,300kW from 2 market actors
- Investigating other alternatives due to high price for other flexibility
- Accepted price is commercially sensitive
- Technologies accepted were;
  - Flexible Demand
  - Solar PV

11

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1300 - 1330

Lunch

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LIFO Stack (NB)

1330 - 1345

13

Scenarios (DM)

1345 - 1445

- Each market actor has a number of scenarios to consider as a group;
- Each scenario directs you to rules to consider
- Consider;
  - did the rules address the outcome of the scenario?
  - were there any unintended consequences?
  - what changes should there be to the market rules?
- Facilitator to provide feedback (10 minutes)

14

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1445 - 1500

Break

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How to Break the Market Rules (DM)

1500 - 1545

- Based on your experience of the day and from your personal experience, how could you take advantage of the market rules to make more money or reduce your risk?
- Consider as a group;
- Facilitator to provide feedback (10 minutes)

16

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Q&A and Overview (BW)

1545 - 1600

17

Thank you

Safe Journey

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Appendix 4 – Scenarios for the External Stakeholder Event

Scenario 1: Flexibility Service Test

An asset has failed to pass the flexibility test for a service but has a contract to provide that flexibility service.

What do the rules say should happen and what changes would you make (if any)?

Rules; 1.4.1-1.4.3, 1.5.1, 2.1.3, 4.1.1, 4.2.1, 4.4.1, 4.4.2

Role

Scenario 2: Transaction Approval

A peer-to-peer transaction to exceed Import and Export Capacity requires DNO approval before it can become contractually binding.

What do the rules say should happen and what changes would you make (if any) if the following happened;

- the DNO does not agree to the transaction?
- the DNO does not respond within agreed timescales?
- the service is delivered without approval?

Rules; 1.1.1-1.1.5, 3.1.1, 4.5.1-5.1.2, 7.1.1

Role

Scenario 3: Service Stacking

A flexibility provider wants to stack several services to increase revenue in one of the following ways;

- providing different services at different times (no time overlap);
- provide different services at the same time (limited time overlap); or
- provide two different services at the same time (full time overlap).

What do the rules say should happen and what changes would you make (if any)?

Rules; 3.3.1-3.5.1, 4.1.2-4.2.1, 4.4.1-5.1.2, 6.1.1, 6.3.1-6.3.3, 7.1.1

Role

Scenario 4: Interruption to Service

A flexibility provider is delivering a service and the ESO or DSO has asked them to stop delivering that service.

What do the rules say should happen and what changes would you make (if any) in the following circumstances;

- if the reason was a broken switch on the network?
- if the reason was a storm front?
- if the flexibility transaction was for the benefit of the ESO or DSO?
- if the flexibility transaction was not for the benefit of the ESO or DSO?

Rules; 1.4.4, 4.3.1, 5.1.1, 5.2.1, 5.2.4-6.1.2, 6.1.5, 6.2.1-6.2.3, 6.3.2. 7.1.1, 7.1.2

Role

Scenario 5: DNO Planned Outage

An asset has a long-term flexibility transaction in place. The local DNO has notified there will be a planned outage during the term of the transaction.

What do the rules say should happen and what changes would you make (if any)?

Would it make any difference if the DSO had approved the transaction?

Rules; 1.4.4, 4.5.1, 4.5.2, 5.2.1, 5.2.4, 6.1.2, 6.2.1, 6.3.2, 6.4.1

Role

Scenario 6: DNO Unplanned Outage

The electricity supply to a site with flexibility is currently experiencing an unplanned outage of its DNO connection.

What do the rules say should happen and what changes would you make (if any) in the following circumstances;

- if service delivery starts in two hours?
- if service was being delivered when the unplanned outage started?

Rules; 1.4.4, 4.5.1, 4.5.2, 5.2.1, 5.2.4, 6.1.2, 6.1.6, 6.3.2, 6.4.1, 7.2.1

Role

Scenario 7: Service Delivery

A DSO flexibility service is scheduled to be provided by an asset.

What do the rules say should happen and what changes would you make (if any) if the ESO or DSO asks the asset;

- to not provide the service due to an impending storm front?
- to stop delivering the service early?
- to change the time of delivery?
- to deliver a service when there is no contract?

Rules; 1.4.4, 4.3.1, 4.4.3-4.5.2, 5.1.2, 5.2.1, 5.2.4, 6.1.2, 6.2.1-6.4.1

Role

Scenario 8: DNO System Changes

The DNO reconfigures the electricity network to allow for maintenance of the local substation and this makes a difference to the flows on the network.

What do the rules say should happen and what changes would you make (if any)?

Rules; 1.4.4, 4.5.1, 5.2.1, 5.2.4, 6.4.1

Role

Scenario 9: Asset Availability

An asset is unavailable prior to the delivery of a service.

What do the rules say should happen and what changes would you make (if any) in the following circumstances;

- replace the asset with another from the flexibility portfolio?
- substitute the asset with another asset from a third party?
- no replacement or substitution can be made.

Rules; 1.4.4, 2.2.1, 3.3.1, 3.3.2, 4.1.2, 4.1.3, 4.3.1-4.4.3, 5.1.2-5.2.4, 6.1.2, 6.3.3-7.1.1

Role

Scenario 10: Data Quality

The metering indicates there is a shortfall in a Settlement Period in the delivery of a service but no missing data.

What do the rules say should happen and what changes would you make (if any)?

Would the level of shortfall matter, e.g. 1%, 2%, 5%, or 10%?

Rules; 1.2.1, 1.4.4, 3.2.1, 6.1.2, 6.1.6, 7.1.1

Role

Scenario 11: Making up Shortfall in Delivery

An asset was unable to deliver the service within the service parameters for 10 minutes of a Settlement Period but could over-deliver for the remainder of the Settlement Period to provide the contracted kWh in that Settlement Period.

What do the rules say should happen and what changes would you make (if any)?

Rules; 1.4.4, 3.3.1, 3.3.2, 4.3.1, 4.5.1, 5.2.1-6.1.6, 7.2.1

Role

Scenario 12: Data Missing

There is missing data for the delivery of a flexibility service.

What do the rules say should happen and what changes would you make (if any) in the following circumstances;

- missing data for part of one Settlement Period only?
- missing data for one or more Settlement Periods?
- missing data for the entire delivery period?

Rules; 1.2.1-1.3.2, 1.4.4, 3.3.1, 3.3.2, 4.3.1, 6.1.2, 6.1.3, 7.1.1, 7.2.1

Role

Scenario 13: ESO and DSO Conflict

The ESO wants the DSO to avoid using a particular asset to deliver flexibility as it would cause a problem for the ESO.

What do the rules say should happen and what changes would you make (if any)?

What would happen to any trades that are active at that time?

Rules; 6.2.1-6.2.5, 6.3.2, 7.2.1

Role

Scenario 14: Loss of Communications

Communications are vital for the delivery of a critical service but there is a loss of communication with the asset providing the flexibility.

What do the rules say should happen and what changes would you make (if any) if the communications were lost;

- a long time prior to the start of delivery?
- just prior to the start of delivery?
- during delivery?

Rules; 1.4.4, 2.1.1-2.1.3, 6.3.3-7.1.1

Role

Scenario 15: Flexibility Auction

An asset has failed to deliver a flexibility service recently. It has submitted an offer into an auction for the same service.

What do the rules say should happen and what changes would you make (if any)?

Would the level or number of occasions of poor performances make any difference to your answer and, if so, why?

Rules; 1.4.4, 4.4.1, 4.4.2, 4.6.1, 5.1.2, 5.2.1, 5.2.4, 7.2.1

Role

Appendix 5 – Trading Cards for the External Stakeholder Event

Offer Card

Role:

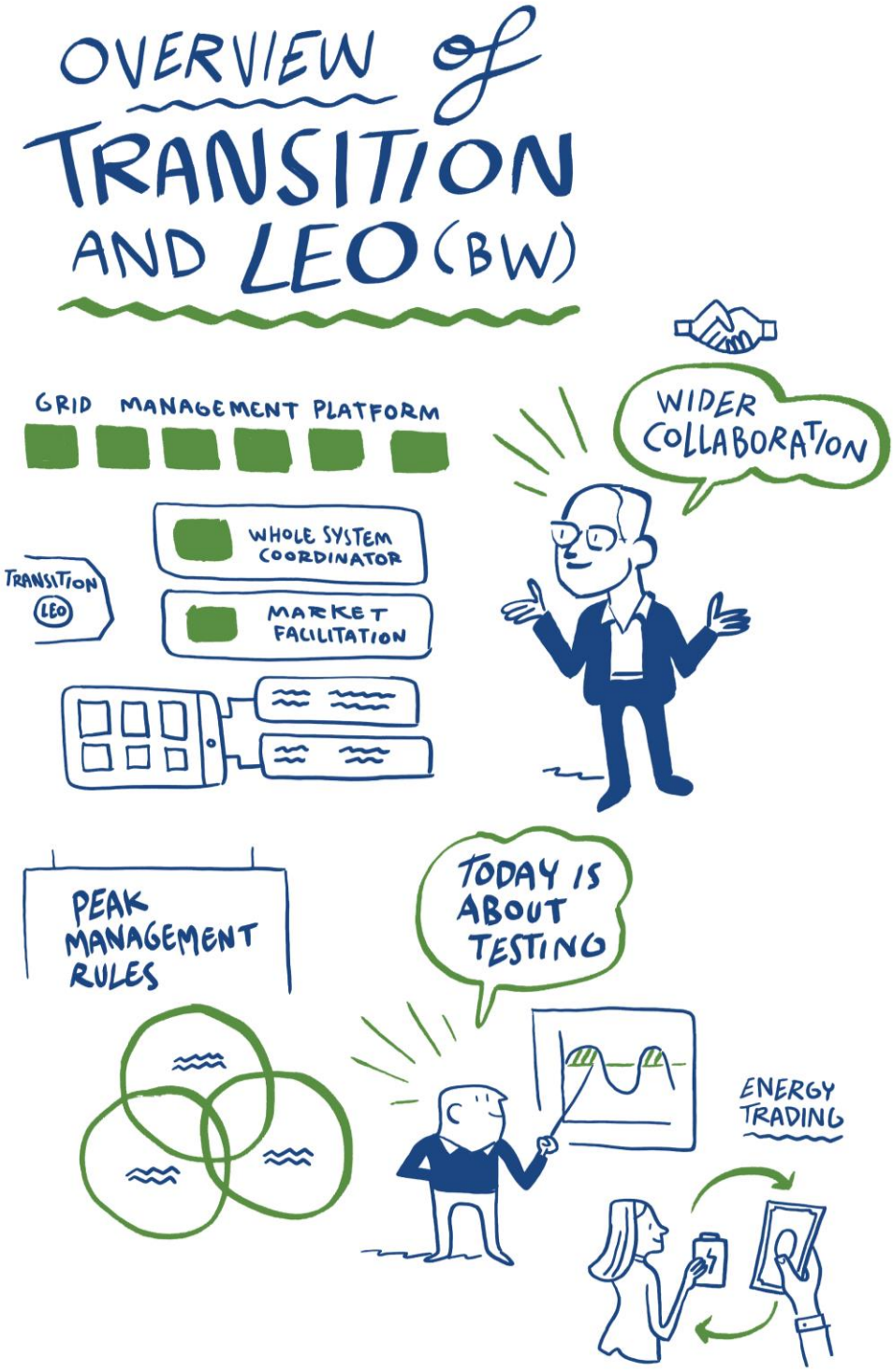
Battery	_____ kW	_____ £/MWh
Biomass	_____ kW	_____ £/MWh
CHP	_____ kW	_____ £/MWh
Flexible Demand	_____ kW	_____ £/MWh
PV	_____ kW	_____ £/MWh
Wind	_____ kW	_____ £/MWh

Acceptance Card

Role:

Battery	_____ kW	_____ £/MWh	☐
Biomass	_____ kW	_____ £/MWh	☐
CHP	_____ kW	_____ £/MWh	☐
Flexible Demand	_____ kW	_____ £/MWh	☐
PV	_____ kW	_____ £/MWh	☐
Wind	_____ kW	_____ £/MWh	☐

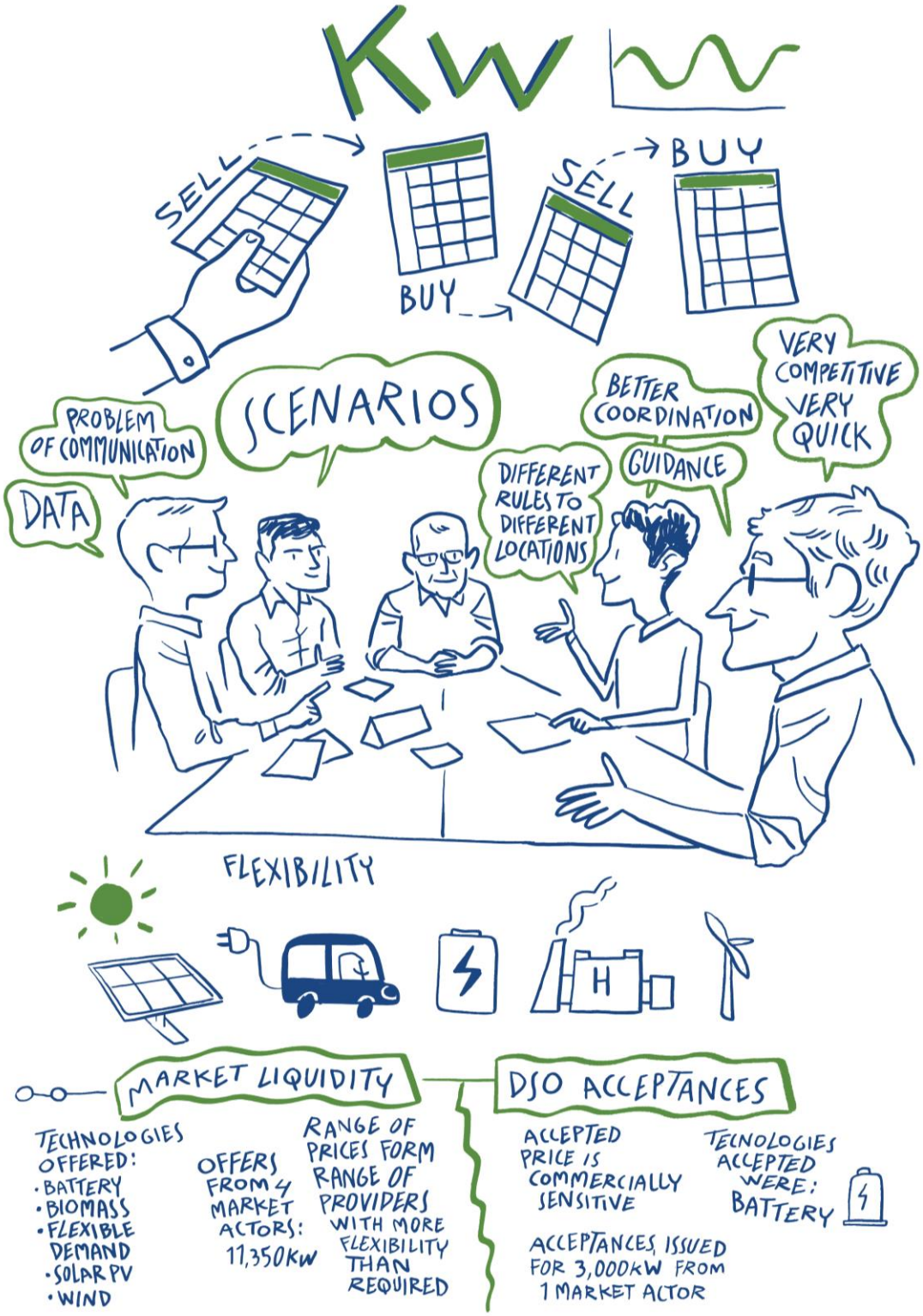
Appendix 6 – Visual Scribe Output from External Stakeholder Events




The ENERGY SYSTEM of THE FUTURE
KEY INDUSTRY TRENDS
DECARBONISATION
DECENTRALISATION
DIGITALISATION
DEMOCRATISATION
SSE GOALS FOR 2030
4Ds
DELIVERY
RELIABILITY
WE TRUST YOU!
WORKING WITH COMMUNITIES
NEW ENERGY
CAPABILITY REQUIREMENT
OUR DSO VISION
SUSTAINABLE
AFFORDABLE
BANKABLE
CUSTOMER CENTRIC
DNO ⇒ DSO


CARTEL
YOU DICTATE THE PRICE
PROMISING THE SAME THING TO DIFFERENT PEOPLE
HA-HA-HA-HA!
DOMINANT POSITION
HOW TO BREAK THE MARKET RULES
RULES
BASELINE MANIPULATION
DESTROY COMPETITION
NOT AGAIN!
METER DATA FRAUD
DATA MANIPULATION
FAKE DEMAND
HACK THE MARKET


DISPUTE AND PARTICIPATION
DSO RESPONSIBILITY
TIMEFRAMES
SCENARIOS
FEED-BACK
YOU SHOULD INFORM THE MARKET PROMPTLY
THOUGTHS
THERE MUST BE A BALANCE HERE!
NOT TO BLACKLIST PROVIDERS
TOLERANT RULES
WE SHOULD LOOK AT DIFFERENT MODELS
BUSINESS MODELS
CONTRACTS STANDARDS AND DEFINITIONS
HIGH CHANCE... OF WHAT?
CHANGE OF TIME OF DELIVERY
TERMS AND CONDITIONS
SERVICE TESTING TIME
NON DELIVERY
COMPENSATION
WHO PAYS FOR IT?
IT COULD BE A RISK FOR THE MARKET PARTICIPANTS


Kw
SELL
BUY
SELL
BUY
SCENARIOS
PROBLEM OF COMMUNICATION
DATA
BETTER COORDINATION
GUIDANCE
VERY COMPETITIVE VERY QUICK
DIFFERENT RULES TO DIFFERENT LOCATIONS
FLEXIBILITY
H
MARKET LIQUIDITY
TECHNOLOGIES OFFERED:
• BATTERY
• BIOMASS
• FLEXIBLE DEMAND
• SOLAR PV
• WIND
OFFERS FROM 4 MARKET ACTORS: 11,350KW
RANGE OF PRICES FORM RANGE OF PROVIDERS WITH MORE FLEXIBILITY THAN REQUIRED
DSO ACCEPTANCES
ACCEPTED PRICE IS COMMERCIALLY SENSITIVE
TECNOLOGIES ACCEPTED WERE: BATTERY
ACCEPTANCES ISSUED FOR 3,000KW FROM 1 MARKET ACTOR


EXPLORING OPTIONS FOR THE EXCHANGE OF 'ACCESS RIGHTS'
CAPACITY
USERS REDUCING THEIR MAXIMUM CAPACITY RIGHTS
12%
11%
10%
6%
4%
3%
1%
TRADING BETWEEN A GENERATOR AT RISK
PRINCIPLES
ena
ENERGY NETWORK ASSOCIATION
3
VISIBILITY OF OTHER POTENTIAL TRADING PARTIES
1
TRANSPARENT INFORMATION SHARING
2
ABILITY TO MAINTAIN NETWORK CONTINUITY
4
TRANSPARENT TRADING ARRANGEMENTS

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